



STORAGE

FAQ

Q I've just bought a new hard disk, and wondered why the reported capacity of the hard disk in Windows is less than the manufacturer's stated capacity on the packaging. Am I being ripped off?

A There are two ways of reporting the capacity of a hard disk. Windows and other software use the binary system, while hard disk manufacturers use the decimal system. One of the most basic units of measuring the capacity of a hard disk is the kilobyte. In the binary system, which expresses numbers as powers of two, a kilobyte is defined as 1,024 bytes. According to the decimal system, which expresses numbers as powers of 10, a kilobyte consists of 1,000 bytes. As you can see, at the kilobyte level there is only a slight difference between the binary and decimal systems.

When hard disks were only 40 or 80 megabytes in size, no-one noticed this minimal distinction – least of all the hard disk manufacturers, who used the decimal system in their marketing and on their packaging as these numbers were thought less confusing to the average consumer. But as hard disks ballooned to gigabytes in size, the difference between the two systems became more obvious. A gigabyte in the decimal system is 1,000,000,000 bytes, but a gigabyte in the binary system is 1,073,741,824 bytes. So a hard disk sold as 160GB (decimal) by the manufacturer will be reported by your computer as under 150GB (binary). Since both measurements are technically correct, you are not being ripped off.

However, the use of two number systems to describe the same thing is undoubtedly confusing. There are lawsuits in the American courts aimed at forcing hard disk and computer manufacturers to market their products using the binary rather than the decimal system, thereby simplifying the whole affair.

In addition, when a hard disk is formatted, space has to be reserved for the file allocation table, which keeps track of where all your data is physically stored on the disk.

alan@computershopper.co.uk



▲ Hard disk manufacturers use a different method of measuring capacity to the one used by Windows

REVIEW DVD WRITERS

LG
GSA-2166D

RATING ★★★★★

PRICE £70 inc VAT

SUPPLIER www.pixmania.co.uk

DETAILS www.lgelectronics.co.uk

BENQ
EW164B

RATING ★★★★★

PRICE £73 inc VAT

SUPPLIER www.morecomputers.co.uk

DETAILS www.benq.co.uk

If you're looking for a DVD writer but don't have the room, or even the inclination, to fit one inside your PC, an external USB drive will do the job. We've looked at two such drives that fit the bill: LG's GSA-2166D and BenQ's EW164B.

BenQ's drive is the better-looking of the two, but we are more interested in performance. Both drives connect over USB Hi-Speed and have a similar set of specifications. Single-layer performance was very good from both the drives, with DVD+R discs written in five minutes and 45 seconds. LG managed this speed for DVD-R, but BenQ's drive lagged slightly behind with a disc-recording time of six minutes and 16 seconds. Still, it's hardly what we'd consider slow.

The BenQ EW164B was by far the best drive for DVD+R DL, recording a disc in a blistering 15 minutes and 17 seconds. This is the best performance we've ever seen for dual-layer media. Unfortunately, LG couldn't keep up. Its drive records DVD+R DL discs only at 6X, and it took just over 21 minutes to complete. LG has informed us that a



firmware update will take DVD+R DL performance to 8X, but this was unavailable as we went to press.

The GSA-2166D is a LightScribe drive. With the correct media, you can laser-etch a label on your recorded discs. LG claims that its drive is the fastest on the market, etching a disc in around 20 minutes compared to the 40 minutes it takes most drives. This is true, but only in draft mode, which recorded a barely legible design on our test disc. Better quality results at Best quality take around 40 minutes, the same as for other LightScribe drives.

Both these drives perform well. If you write a lot of DVD+R DL discs, BenQ's drive is currently the best performer. If you want LightScribe then LG's drive is an excellent choice, and it should get faster once the firmware update has been released.

Alan Lu

SPECIFICATIONS LG: External USB Hi-Speed LightScribe two-layer DVD+/-RW +/-DL drive, 16X DVD-R, 16X DVD+R, 6X DVD-RW, 8X DVD+RW, 4X DVD-R DL, 6X DVD+R DL, 48X CD-R, 32X CD-RW. **Part code** 3890H-1992A. **BenQ:** External USB Hi-Speed two-layer DVD+/-RW +/-DL drive, 16X DVD-R, 16X DVD+R, 6X DVD-RW, 8X DVD+RW, 4X DVD-R DL, 48X CD-R, 32X CD-RW. **Part code** 9J.B7N15.0F2

HOTLIST INTERNAL DVD WRITER

NEC
ND-4550A

RATING ★★★★★

PRICE £39 inc VAT

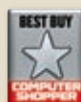
SUPPLIER www.techfever.co.uk

DETAILS www.nec.co.uk

NEC's latest DVD writer is just as good as its predecessor. It may not come with any software, but it's quick to burn discs. It can handle DVD+R DL discs in just over 19 minutes thanks to its 8X write speed.

It's also cheap, although owners of the ND-3550A will have little reason to upgrade.

SPECIFICATIONS 16X DVD-R, 16X DVD+R, 6X DVD-RW, 8X DVD+RW, 6X DVD-R DL, 8X DVD+R DL, 48X CD-R, 32X CD-RW, 5X DVD-RAM. **Part code** ND-4550A



HOTLIST PORTABLE HARD DISK

WESTERN DIGITAL
Passport 80GB

RATING ★★★★★

PRICE £98 inc VAT

SUPPLIER www.dabs.com

DETAILS www.wdc.com

Western Digital's rubber-bottomed Passport is an excellent portable disk. It's a little bigger than a PDA and weighs just 238g, so it's easy to carry around. Inside is a 2½" hard disk that provides 80GB of storage. It connects via USB Hi-Speed and provides the kind of transfer speeds usual for such a disk; large files transfer at around 22MB/s and small files at 7MB/s. It's ideal as a second notebook hard disk or as portable file storage.

SPECIFICATIONS 80GB capacity, USB Hi-Speed interface, USB powered. **Part code** WDXML80UETE





REVIEW NETWORK STORAGE

EVESHAM SilverSTOR XS

RATING ★★★★★

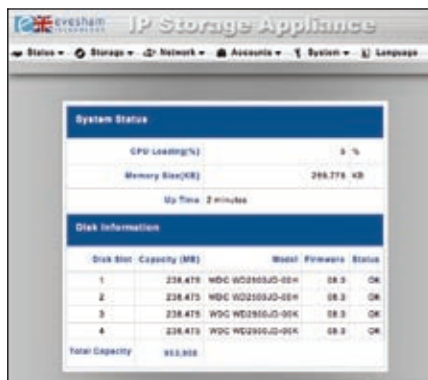
PRICE £998 inc VAT

SUPPLIER Evesham 08701 609500

DETAILS www.evesham.com

Network attached storage (NAS) devices are useful in the workplace or home, as you can share and back up files over a network without having to dedicate a PC to the task. In a home environment this can be especially useful if you need to share gigabytes of music, video and photos between several computers.

The SilverSTOR is about the size of a Shuttle small form factor PC and has 1TB of storage thanks to four 250GB SATA 150 hard disks, although other capacities are available. The hard disks can be hotswapped quite easily since the key-lockable trays slide out of the front of the unit. Hard disks are simply screwed into these trays, so they are easy enough to replace.



Evesham's SilverSTOR XS allows you to store data and share it among colleagues when you need to

Blinking LEDs indicate disk activity and whether a hard disk has failed or not and the SilverSTOR can even send you an email in the event of disk failure. Two Gigabit Ethernet ports are present and a mini PCI WiFi adaptor can be added. If you need wireless connectivity, the SilverSTOR can instead be connected to your wireless router via an Ethernet cable. However, accessing your data wirelessly will be a lot slower than using Ethernet.

The SilverSTOR offers software-managed RAID 0, 1 or 5 arrays, so you can choose between different levels of data redundancy or just maximise the amount of available storage capacity depending on your needs. You can also configure spanning, also known as Just a Bunch Of Disks (JBOD), which doesn't offer a performance increase or data redundancy. With RAID available, configuring the SilverSTOR XS for this mode seems like a strange choice to us.

Configuring the various options may require you to refer to the manual, especially if you aren't familiar with the different RAID variants, so it's a shame that the manual is a PDF rather than a printed guide.

The SilverSTOR attaches directly to your Ethernet router or switch, so administering the SilverSTOR is done using a web browser on any network-attached computer, Windows or otherwise. Initial setup using the printed quick installation guide was easy enough, although a setup wizard would have been even better.

Users and groups of users can be given differing levels of access to different folders located on the SilverSTOR so no-one can see, copy or delete anything they shouldn't. The web interface for configuring these Access Control Lists is quirky and fiddly, with a logic all its own, although the Access Control Lists can use an Active Directory server instead if you have a Windows Server PC.

Folders can be assigned a drive letter using the standard Windows Map Network Drive command so they show up in Windows Explorer in the same way as any other disk.



Over an Ethernet network, our large file test wrote files at 7.19MB/s and read files at 6.39MB/s; small files were written at just over 1MB/s and read at a snail-like 0.14MB/s. This performance is in line with similar devices, although the small files performance is quite poor.

The SilverSTOR's hotswapping capabilities and multitude of configuration options make it an appealing option for small and medium-sized businesses that have a Windows domain to manage their networks. However, it's expensive for the capacity. Buffalo's Terastation offers the same capacity, is easier to configure for home environments and, more importantly, costs half as much (see our Hotlist, below).

Alan Lu

✓ Easily accessible hard disk trays; integrates with Windows

✗ Fiddly web-based configuration; expensive

SPECIFICATIONS Network storage, takes up to four SATA hard disks, 2x 1,000Mbit/s network connections. **Part code** SILVERSTORXSNOV05

HOTLIST INTERNAL HARD DISK

SAMSUNG SpinPoint SP2504C

RATING ★★★★★

PRICE £79 inc VAT

SUPPLIER www.komplett.co.ukDETAILS www.samsung.com

Samsung's SpinPoint SP2504C was the best hard disk in our recent Labs test (*Shopper* September 2005). It combines good value with cutting-edge technology. Its 250GB of storage is accessed through a SATA II interface with Native Command Queuing at a maximum transfer rate of 300MB/s. If you're looking for more internal storage and you have a free SATA connector, this is the drive to buy.



SPECIFICATIONS 3½" internal hard disk, 250GB capacity, 232GB formatted capacity (NTFS), SATA 300 interface, 7,200rpm spindle speed, 8MB cache. **Part code** SP2504C

HOTLIST NETWORK-ATTACHED STORAGE

BUFFALO Terastation 1TB

RATING ★★★★★

PRICE £485 inc VAT

SUPPLIER www.shopmagenta.comDETAILS www.morecomputers.co.uk

If your hard disk is already full of digital photographs and music files, Buffalo's 1TB Terastation is the perfect answer, providing an excellent way to boost storage on a network. This device has four 250GB hard disks. You can also use RAID to protect your valuable data. The system is very easy to set up, and considering the price of the individual components it's great value.



SPECIFICATIONS 1TB storage (four 250GB hard disks), Gigabit Ethernet, four USB2 ports. **Part code** HD-H1.0TGLR5

HOTLIST DISK CADDY

ICYBOX IB-360

RATING ★★★★★

PRICE £20 inc VAT

SUPPLIER www.overclockers.co.ukDETAILS www.raidsonic.de

If you have a spare IDE hard disk lying around, IcyBox's IB-360 caddy can turn it into an external disk. It's attractive to look at and connects via USB Hi-Speed. Performance using a spare hard disk is good and in line with purpose-built external hard disks. It's good value.



SPECIFICATIONS External hard disk caddy, external power supply, USB Hi-Speed interface, PATA hard disk interface. **Part code** IB-360U-BL